Filed: February 12, 2001

Title: INTEGRATED INTERACTIVE SOFTWARE VISUALIZATION ENVIRONMENT

IN THE CLAIMS

Please amend the claims as follows.

(Currently Amended) A computer-implemented method, comprising:

 analyzing source code to determine a program slice;
 creating a program slice diagram that provides a graphical representation of the program slice;

displaying the program slice diagram;

displaying a code browser operable to display a subset of the source code;

displaying a BLAST viewer having one or more control blocks;

determining a cross-reference between the program slice diagram, a control block in the one or more control blocks, and a portion of subset of the source code; node of the one or more nodes, and

indicating the cross reference in the code browser, the BLAST viewer and the program slice diagram.

- 2. (Currently Amended) The method of claim 1, wherein the program slice diagram further comprises a directed graph comprising a plurality of nodes and arcs, wherein the arcs represent data flow dependencies between the nodes.
- 3. (Canceled)
- 4. (Original) The method of claim 2, wherein the nodes represent source code statements within a selected subroutine.
- 5. (Original) The method of claim 2, wherein the nodes represent variable references outside of a selected subroutine.

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6-10. (Canceled)

11. (Currently Amended) The method of claim 1, further comprising A computer-implemented method, comprising:

displaying a template viewer, said template viewer operable to receive semantic information;

in response to the analyzing element, performing semantic abstraction to group a subset of the nodes together based on the semantic information

analyzing source code to determine a program slice using the subset of nodes;

creating a program slice diagram that provides a graphical representation of the program slice; and

displaying the program slice diagram.

- 12. (Original) The method of claim 11, further comprising: identifying a logical category of computations; and displaying the logical category of computations with a cross-reference to a display of the source code.
- 13. (Original) The method of claim 11, wherein performing semantic abstraction further comprises:

identifying a logical category of data elements; and displaying the logical category of data elements with a cross-reference to a display of data.

14-18. (Canceled)

19. (Original) The method of claim 2, further comprising:

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simplifying the program slice diagram by retaining only those nodes that correspond to variable references outside of a selected subroutine.

- 20. (Currently Amended) The method of claim [[1]] 11, wherein the semantic information comprises a logical event, and wherein further comprising: performing event abstraction [[by]] includes collapsing together nodes that correspond to [[a]] the logical event.
- 21. (Canceled)
- 22. (Currently Amended) A signal-bearing media comprising computer-readable instructions, wherein the instructions when read and executed by a computer comprise:

analyzing source code to determine a program slice;

creating a program slice diagram that provides a graphical representation of the program slice; and

displaying the program slice diagram;

displaying a code browser operable to display a subset of the source code;

displaying a BLAST viewer having one or more control blocks;

determining a cross-reference between the program slice diagram, a control block in the one or more control blocks, and a portion of subset of the source code; node of the one or more nodes, and

indicating the cross reference in the code browser, the BLAST viewer and the program slice diagram.

23. (Currently Amended) The signal-bearing media of claim 22, wherein the program slice diagram further comprises a directed graph comprising a plurality of nodes and arcs wherein the arcs represent data flow dependencies between the nodes.

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24. (Canceled)

- 25. (Original) The signal-bearing media of claim 23, wherein the nodes represent source code statements within a selected subroutine.
- 26. (Original) The signal-bearing media of claim 23, wherein the nodes represent variable references outside of a selected subroutine.

27 – 31. (Canceled)

32. (Currently Amended) The signal-bearing media of claim 22, further comprising A signalbearing media comprising computer-readable instructions, wherein the instructions when read and executed by a computer comprise:

displaying a template viewer, said template viewer operable to receive semantic information;

in-response to the analyzing element, performing semantic abstraction to group a subset of the nodes together based on the semantic information

analyzing source code to determine a program slice using the subset of nodes; creating a program slice diagram that provides a graphical representation of the program slice; and

displaying the program slice diagram:

33. (Original) The signal-bearing media of claim 32, further comprising: identifying a logical category of computations; and displaying the logical category of computations with a cross-reference to a display of the source code.

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34. (Original) The signal-bearing media of claim 32, wherein performing semantic abstraction further comprises:

identifying a logical category of data elements; and displaying the logical category of data elements with a cross-reference to a display of data.

35-39. (Canceled)

- 40. (Original) The signal-bearing media of claim 22, further comprising: simplifying the program slice diagram by retaining only those nodes that correspond to variable references that are outside of a selected subroutine.
- 41. (Currently Amended) The signal-bearing media of claim [[22]] 32, wherein the semantic information comprises a logical event, and wherein further comprising: performing event abstraction [[by]] includes collapsing together nodes that correspond to a logical event.

42 - 63 (Canceled).

- 64. (Currently Amended) A software visualization environment for visualizing source code, comprising:
 - a code browser to display source code;
 - a block-level abstract syntax tree viewer;
- a program slice browser to display a program slice as a directed graph comprising a plurality of nodes; and
 - a template viewer; and
- a controller that cross-references information between the code browser, the block-level abstract syntax tree viewer, the program slice browser, and the template viewer.

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65 - 67. (Canceled)

68. (Currently Amended) The software visualization environment of [[65]] <u>64</u>, wherein the code browser further:

displays line numbers that cross reference to other visualization components.

- 69 77. (Canceled)
- 78. (Currently Amended) The software visualization environment of claim [[73]] <u>64</u>, wherein the program slice browser further:

displays the directed graph in upside-down-tree layout, wherein the nodes are positioned according to a data-flow pattern.

- 79 90. (Canceled)
- 91. (Currently Amended) The software visualization environment of claim [[61]] <u>64</u>, wherein the template viewer further:

displays a binding between a logical view of the source code and the source code.

92. (Original) The software visualization environment of claim 91, wherein the binding comprises a template, comprising:

abstract data structures; and

logical steps that manipulate the abstract data structures.

93-94. (Canceled)